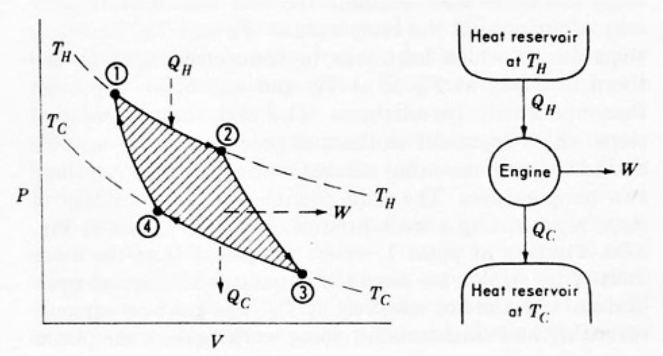
In the figure below the process from state 1 to state 4 and back to 1 can be used to construct a set of thermodynamic arrows of time pointing from state to state.

THE PROCESS ILLUSTRATED AT THE RIGHT COULD BE REVERSED BY DOING WORK ON THE SYSTEM OR EXTRACTING WORK FROM THE SYSTEM



THERMODYNAMIC 'ARROWS OF TIME' CAN BE APPLIED TO THE PROCESS PATHWAYS POINTING FROM INITIAL TO FINAL STATES ALONG THE SYSTEM DIAGRAM AT LEFT

A THERMODYNAMIC ARROW OF TIME DEFINED FOR A PROCESS THAT INVOLVES ENERGY FLOW [Q] AND WORK [W]

THE THERMODYNAMIC ARROW OF TIME POINTING FROM THE inital [1] TO THE final [2] STATES OF THE SYSTEM

T	P	V	Q_{rev}	W_{rev}
T_1	P_1	V_1	0	0
↓	↓	↓	↓	↓
T_2	P_2	V_2	Q^f_{rev}	W^f_{rev}

* The superscript f to Q_{rev} and W_{rev} indicates a final value.

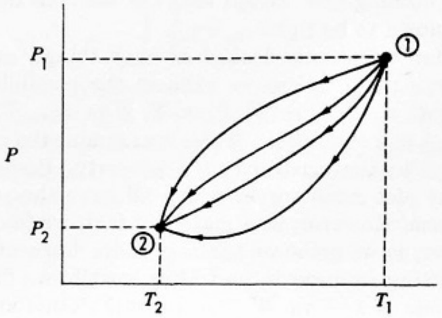
INITAL STATE USED TO DEFINE INITAL TIME

t(1)

FINAL STATE USED TO DEFINE FINAL TIME

t(2)

NOTE THAT APPLIED ARROWS OF TIME BY AN OBSERVER ARE SCALED USING AN EXTERNAL CLOCK TO QUANTIFY THE TIME SCALE



ALL THE THERMODYNAMIC LAWS ARE NOT VIOLATED DURING THE FORWARD PROCESS OR ITS PROCESS REVERSAL

THE PATHS FROM STATE (1) TO STATE (2) CAN BE USED TO DEFINE PROCESS DEPENDENT THERMODYNAMIC ARROWS OF TIME 'ALONG' THESE PATHS WHEN COMPARED TO A STANDARD CLOCK

In the figure above we see that a thermodynamic arrow ot time can be assigned to the process from state 1 to state 2.

PROCESS REVERSAL IS NOT TIME REVERSAL !!!